

According to basic principles of economics, trading resources according to their proper valuation should bring about the most efficient use of available resources. In practice, however, valuation of resources is anything but easy. Each party in an economic transaction can be assumed to be acting in his or her own best interest, and that best interest is almost certainly opposed to that of the other, assuming a two-party transaction. Thus, a seller will want to receive a high price for a good, and a buyer will want to pay a low price (no price at all is even better).

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To complicate matters, many resources are difficult to value simply because the parties to a transaction have access to only limited information about the resource. A prime example of this is corporate stock. The ownership rights to a portion of a corporation are difficult to value, simply because much of the information pertaining to a corporation and its earning potential is not public, and much of what is public cannot be predicted.

To solve this fundamental problem of valuation, people have, over time, devised different market mechanisms or negotiating schemes for determining resource values. Auctions, where buyers submit bids and certain buyers "win" (buy the product) and other buyers "lose" (are prevented from buying the product) are a common market mechanism.

Online selling through the Internet has made it simpler to search for and purchase products (particularly hard to find items), because of automated searching. Online auctioning, in particular, is a convenient means for buying and selling products, because, unlike conventional auctioning, online auctioning is not limited by any physical space--anyone can buy or sell from anywhere in the world.

This enormous flexibility is not without some drawbacks, however. Many merchants and consumers are less than reputable--that much is axiomatic. For this reason, merchants and consumers in a physical environment attempt to shield themselves from disreputable commercial conduct in a number of ways. These range from the objective (e.g., relying on a credit report to screen customers) to the subjective (e.g., relying on one's intuitive sense of a person's honesty to screen customers

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or merchants). In an online environment, however, many of these safeguards disappear.

As an attempt to remedy this inability to screen potential business contacts, the online auction house
5 eBay, Inc., of San Jose, California, has developed a rating system, whereby buyers and sellers rate other buyers and sellers with whom they do business. This rating system provides users of eBay's online auction facility with information they can use when deciding when
10 to do business with another user. Thus, eBay allows its users to view others' subjective observations with regard to other users.

The eBay rating system, however, is purely subjective and must rely solely on user comments. This
15 is problematic for two reasons. One is that new users, who have little or no ratings from other users, are at a disadvantage, because their ratings will be low until enough other users give them positive ratings. Another is that it is easy to abuse such a rating system by
20 engaging in sham transactions with co-conspirators to give each other high ratings.

Another drawback to eBay's rating system is that the information that eBay collects is only usable at eBay's website. It cannot be used at other Internet auction
25 sites.

What is needed, then, is a rating system that includes some objective criteria for determining ratings.

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SUMMARY OF THE INVENTION

The present invention provides a method, computer program product, and apparatus for providing a user rating service for online auctions. Objective criteria, such as credit information, are combined with subjective ratings to create a user profile. Using objective criteria to supplement user ratings treats new users more fairly and prevents auction participants from inflating their ratings collusively. The user profile may be shared among online auction services, so that a user's aggregate transaction and ratings history may be used at a number of sites.

BRIEF DESCRIPTION OF THE DRAWINGS

The novel features believed characteristic of the invention are set forth in the appended claims. The invention itself, however, as well as a preferred mode of use, further objectives and advantages thereof, will best be understood by reference to the following detailed description of an illustrative embodiment when read in conjunction with the accompanying drawings, wherein:

Figure 1 is a diagram of a networked data processing system in which the present invention may be implemented;

Figure 2 is a block diagram of a server in which the present invention may be implemented;

Figure 3 is a block diagram of a client in which the present invention may be implemented.

Figure 4 is a diagram of a preferred embodiment of the present invention;

Figure 5 is a diagram of data structures used within databases of a preferred embodiment of the present invention;

Figure 6 is a diagram of a process of registering a user in a preferred embodiment of the present invention;

Figure 7 is a diagram of a process of establishing an auction of a particular item in a preferred embodiment of the present invention;

Figure 8 is a diagram of a process of conducting an auction in a preferred embodiment of the present invention;

Figure 9 is a flowchart representation of a process of registering a user in a preferred embodiment of the present invention;

Figure 10 is a flowchart representation of a process of establishing an auction of an item in a preferred embodiment of the present invention;

Figure 12 is a flowchart representation of updating a user's profile in a preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference now to the figures, **Figure 1** depicts a pictorial representation of a network of data processing systems in which the present invention may be implemented.

5 Network data processing system **100** is a network of computers in which the present invention may be implemented. Network data processing system **100** contains a network **102**, which is the medium used to provide communications links between various devices and computers
10 connected together within network data processing system **100**. Network **102** may include connections, such as wire, wireless communication links, or fiber optic cables.

In the depicted example, server **104** is connected to network **102** along with storage unit **106**. In addition,
15 clients **108**, **110**, and **112** are connected to network **102**. These clients **108**, **110**, and **112** may be, for example, personal computers or network computers. In the depicted example, server **104** provides data, such as boot files, operating system images, and applications to clients
20 **108-112**. Clients **108**, **110**, and **112** are clients to server **104**. Network data processing system **100** may include additional servers, clients, and other devices not shown. In the depicted example, network data processing system **100** is the Internet with network **102** representing a
25 worldwide collection of networks and gateways that use the TCP/IP suite of protocols to communicate with one another. At the heart of the Internet is a backbone of high-speed data communication lines between major nodes or host computers, consisting of thousands of commercial,
30 government, educational and other computer systems that

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route data and messages. Of course, network data processing system **100** also may be implemented as a number of different types of networks, such as for example, an intranet, a local area network (LAN), or a wide area network (WAN). **Figure 1** is intended as an example, and not as an architectural limitation for the present invention.

Referring to **Figure 2**, a block diagram of a data processing system that may be implemented as a server, such as server **104** in **Figure 1**, is depicted in accordance with a preferred embodiment of the present invention. Data processing system **200** may be a symmetric multiprocessor (SMP) system including a plurality of processors **202** and **204** connected to system bus **206**. Alternatively, a single processor system may be employed. Also connected to system bus **206** is memory controller/cache **208**, which provides an interface to local memory **209**. I/O bus bridge **210** is connected to system bus **206** and provides an interface to I/O bus **212**. Memory controller/cache **208** and I/O bus bridge **210** may be integrated as depicted.

Peripheral component interconnect (PCI) bus bridge **214** connected to I/O bus **212** provides an interface to PCI local bus **216**. A number of modems may be connected to PCI local bus **216**. Typical PCI bus implementations will support four PCI expansion slots or add-in connectors. Communications links to network computers **108-112** in **Figure 1** may be provided through modem **218** and network adapter **220** connected to PCI local bus **216** through add-in boards.

Additional PCI bus bridges **222** and **224** provide interfaces for additional PCI local buses **226** and **228**,

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from which additional modems or network adapters may be supported. In this manner, data processing system **200** allows connections to multiple network computers. A memory-mapped graphics adapter **230** and hard disk **232** may
5 also be connected to I/O bus **212** as depicted, either directly or indirectly.

Those of ordinary skill in the art will appreciate that the hardware depicted in **Figure 2** may vary. For example, other peripheral devices, such as optical disk
10 drives and the like, also may be used in addition to or in place of the hardware depicted. The depicted example is not meant to imply architectural limitations with respect to the present invention.

The data processing system depicted in **Figure 2** may
15 be, for example, an IBM e-Server pSeries system, a product of International Business Machines Corporation in Armonk, New York, running the Advanced Interactive Executive (AIX) operating system or LINUX operating system.

20 With reference now to **Figure 3**, a block diagram illustrating a data processing system is depicted in which the present invention may be implemented. Data processing system **300** is an example of a client computer. Data processing system **300** employs a peripheral component
25 interconnect (PCI) local bus architecture. Although the depicted example employs a PCI bus, other bus architectures such as Accelerated Graphics Port (AGP) and Industry Standard Architecture (ISA) may be used. Processor **302** and main memory **304** are connected to PCI
30 local bus **306** through PCI bridge **308**. PCI bridge **308** also may include an integrated memory controller and cache memory for processor **302**. Additional connections to PCI

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local bus **306** may be made through direct component interconnection or through add-in boards. In the depicted example, local area network (LAN) adapter **310**, SCSI host bus adapter **312**, and expansion bus interface **314** are
5 connected to PCI local bus **306** by direct component connection. In contrast, audio adapter **316**, graphics adapter **318**, and audio/video adapter **319** are connected to PCI local bus **306** by add-in boards inserted into expansion slots. Expansion bus interface **314** provides a connection
10 for a keyboard and mouse adapter **320**, modem **322**, and additional memory **324**. Small computer system interface (SCSI) host bus adapter **312** provides a connection for hard disk drive **326**, tape drive **328**, and CD-ROM drive **330**. Typical PCI local bus implementations will support three
15 or four PCI expansion slots or add-in connectors.

An operating system runs on processor **302** and is used to coordinate and provide control of various components within data processing system **300** in **Figure 3**. The operating system may be a commercially available operating
20 system, such as Windows 2000, which is available from Microsoft Corporation. An object oriented programming system such as Java may run in conjunction with the operating system and provide calls to the operating system from Java programs or applications executing on data
25 processing system **300**. "Java" is a trademark of Sun Microsystems, Inc. Instructions for the operating system, the object-oriented operating system, and applications or programs are located on storage devices, such as hard disk drive **326**, and may be loaded into main memory **304** for
30 execution by processor **302**.

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Those of ordinary skill in the art will appreciate that the hardware in **Figure 3** may vary depending on the implementation. Other internal hardware or peripheral devices, such as flash ROM (or equivalent nonvolatile memory) or optical disk drives and the like, may be used in addition to or in place of the hardware depicted in **Figure 3**. Also, the processes of the present invention may be applied to a multiprocessor data processing system.

As another example, data processing system **300** may be a stand-alone system configured to be bootable without relying on some type of network communication interface, whether or not data processing system **300** comprises some type of network communication interface. As a further example, data processing system **300** may be a Personal Digital Assistant (PDA) device, which is configured with ROM and/or flash ROM in order to provide non-volatile memory for storing operating system files and/or user-generated data.

The depicted example in **Figure 3** and above-described examples are not meant to imply architectural limitations. For example, data processing system **300** also may be a notebook computer or hand held computer in addition to taking the form of a PDA. Data processing system **300** also may be a kiosk or a Web appliance.

Figure 4 provides an overall view of a preferred embodiment of the present invention. Internet **400** connects web clients **402-406** with various servers. Web clients **402-406** contain browser software for viewing hypertext documents from servers within the World Wide Web.

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Hypertext is a method of organizing textual and graphical information on a computer screen. Information is organized into "pages," which resemble printed pages in a book or (perhaps more accurately) printed scrolls
5 (since a hypertext page can be of any length). The primary difference between hypertext and the printed word, however, lies in the fact that hypertext pages can contain links. That is, a portion of a hypertext document, such as a phrase or a graphic, may be made
10 sensitive to clicking by the mouse such that when the user clicks on that portion, the user is directed to a new page or a different section of the current page. For instance, it is a common practice to make bibliographic citations into links. When a user clicks on one of these
15 citations, the cited text appears on the screen. Hypertext documents are displayed using a program called a "browser."

The largest and best-known repository of hypertext documents is the World Wide Web, a loosely bound
20 collection of publicly accessible hypertext documents stored on computers the world over. The World Wide Web has become the preferred Internet medium for publishable information as well as for providing such interactive features as online shopping—to the extent that the terms
25 Internet and World Wide Web are virtually synonymous to some.

Browsers can download hypertext documents from a server with the HyperText Transfer Protocol (HTTP). HTTP allows a browser to request documents or files from a
30 server and receive a response. In addition, when browser users enter information into a form embedded into an hypertext page, the browser transmits the information to

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stores the users' rating information in ratings database **420**, which may or may not be the same as registration database **412**. Having a separate rating server and database storing only a subset of information may provide
5 an added security benefit, as the separate rating server and database need not have direct access to sensitive use data, such as a user's credit report. Auction web server **414** requests a user's rating information from rating server **418** whenever the user wishes to take part in a buy
10 or sell transaction.

Preferably, multiple auction web servers utilize the information stored in rating server **418**. In a preferred embodiment, rating server **418** is operated by a trusted third-party that is neither directly affiliated with any
15 users nor directly affiliated with any of the online merchants.

Trading history server **422** records users' transactions in trading history database **424**. Trading history server **422** cooperates with rating server **418** to
20 update users' ratings as they engage in buying and selling transactions.

Figure 5 provides a tabular diagram describing information stored in each of the databases of **Figure 4**. Table **500** describes the contents of data records stored
25 within registration database **412**. User ID **502** contains information for identifying and authenticating a user, including a user identification string, a password, and the user's real name. Address information **504** contains addresses and telephone numbers for contacting the user
30 or shipping products to the user.

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Rating level **506** is calculated based on objective data, such as credit information **512** (q.v.), and positive and negative feedback from other users. Buying limit **508** and selling limit **510** provide maximum monetary amounts of items that the user may buy or sell. These limits may be defined with respect to a time period (e.g., the maximum dollar amount that may be bought within any given month) or they may be defined with respect to one or more transactions (e.g., the maximum value of an item that may be sold by the user). Much like a credit limit on a credit card, these limits protect sellers from buyers who may tend to overextend their finances and limit the potential losses incurred by buyers who buy from less reputable sellers. Credit information **512** is used to derive buying limit **508** and selling limit **510**; it may also be used in determining a value for rating level **506**.

Table **514** describes the data contained within ratings database **420**. Ratings database **420** contains a user ID **516**, rating **518**, buying limit **520**, and selling limit **522** for each user. Ratings database **420** thus comprises a subset of the information in registration database **500**.

Table **524** describes the contents of merchandise database **416**. For each individual auction, item identification information **526**, an identification of the seller **528**, a quantity to be sold **530**, a description of the item **532**, an optional photo or image of the item **534**, and a time period over which the auction takes place **536** are stored.

Table **538** describes the information stored within trading history database **424**. For each transaction (buy

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or sell) identifications of buyer and seller **540**, a transaction date **542**, a transaction value **544**, seller comments about the buyer **546**, buyer comments about the seller **548** are stored.

5 **Figure 6** is a diagram depicting a process of registering a user in a preferred embodiment of the present invention. Web client **600** provides personal information **601** regarding the registering user to registration server **602**. If so authorized by the user, registration server **602** requests **603** credit information from credit reporting service **604**. Credit rating service **604** sends **605** credit information to registration server **602**. Registration server **602** combines the credit information with the user's personal information to
10 derive a reliability rating for the user. Registration server **602** then shares **606** the user rating and other pertinent information with rating server **607**. Finally, registration server **602** transmits **608** a user ID for the now registered user to web client **600**.

15 **Figure 7** is a diagram depicting the establishment of an auction by a seller in accordance with a preferred embodiment of the present invention. Web client **700**, operated by the seller, transmits **702** a request to set up an auction for a particular item or set of items to
20 auction server **704**. Auction server **704** then requests **706** rating information regarding the seller from rating server **708**. Rating server **708** transmits **710** the seller's rating information back to auction server **704**. At this point, auction server **704** determines whether the proposed
25 auction is allowable in light of the seller's rating information (e.g., the value of the auctioned item does
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not exceed the seller's selling limit or the seller has a high enough rating to establish an auction). If it is, then the auction is established. Finally, auction server 704 transmits notification of the approved or rejected
5 auction to web client 700.

Figure 8 is a diagram depicting the operation of an auction in accordance with an embodiment of the present invention. Web clients 800 and 806 submit bids 802, 808 to auction server 804. Auction server 804, at the close
10 of the auction, determines the winning bidder. Auction server 804 submits 810 a request to rating server 812 for rating information regarding the winning bidder. This information is transmitted 814 back to auction server 804, which in turn transmits 816 the information to web
15 client 818, operated by the seller. In this way, the seller can make informed decisions regarding whether to accept the results of the auction (from a legal standpoint, in most auctions the seller makes the final acceptance of the contract between the buyer and seller)
20 how payment and shipping of the item will be handled. For instance, if the buyer is not reputable, the seller may require payment in advance before shipping the item. In addition, auction server 804 may intervene and prevent a transaction from occurring, if the buyer would be
25 overextending the buyer's buying limit. Finally, trading history server 822 is notified of the transaction.

At some later time, trading history server 822 will report its updated information concerning the buyer and seller to rating server 812, including any feedback from
30 the buyer or seller regarding the transaction. Feedback may be transmitted to auction server 804 from a web

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client by either the buyer or seller and recorded by trading history server **822**.

Figure 9 is a flowchart representation of a process of registering a user (a buyer or seller) within a rating system in accordance with a preferred embodiment of the present invention. First, a user logs on (accesses) the registration server (step **900**). Then, the user provides personal information, such as a name, address, and perhaps one or more identification numbers, such as a social security number, for obtaining a credit report, if the user so authorizes (step **902**). The registration server creates a reliability rating for the user based on the provided information (step **904**). Then, the registration server updates the rating server to include the new rating (step **906**). Finally, the registration server provides a user ID to the now registered user (step **908**).

Figure 10 is a flowchart representation of a process of establishing an online auction in accordance with an embodiment of the present invention. First, a seller logs into an auction (web) server using the seller's user ID (step **1000**). Then, the seller identifies to the auction server the items to be auctioned, their approximate value, and the seller's reliability rating (step **1002**). The auction server then uses the seller's user ID to verify the seller's rating; it also verifies the approximate value of the items (step **1004**). Next, the auction server determines if the proposed auction comports with what the seller is allowed to do in terms of selling (i.e., whether the seller is reliable enough to be allowed to sell, and if so, how much merchandise the seller may sell) (step **1006**). If not, then the

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auction server rejects the auctioning of the items (step 1008). If so, however, the auction server lists the items within its merchandise database for potential buyers to place bids on.

5 **Figure 11** is a flowchart diagram depicting a process of conducting an auction in accordance with a preferred embodiment of the present invention. Buyers bid for a listed item (step 1100). The auction server receives the bids (step 1102). At the close of the auction, the
10 auction server selects the highest bidder (step 1104). At this point, the rating of the highest bidder is retrieved from the rating server (step 1106); the auction server may intervene at this point to prevent the actual purchase from taking place, if the auction server
15 determines that the potential buyer's bid would overextend the buyer's buying limit. Next, the auction server notifies the seller of the results of the auction, including the buyer's reliability rating (step 1108).

At this point, the buyer and seller begin to perform
20 the transaction according to how they negotiate payment and shipping terms (step 1110). The auction server then updates the trading history server with information regarding the auction transaction (step 1112).

25 **Figure 12** is a flowchart representation of a process of creating or updating a user's reliability rating in a preferred embodiment of the present invention. First, user (buyer or seller) logs into the registration server (step 1200). If the user is new (step 1202), then the user is asked to authorize access to the user's credit
30 information; if the user does not wish to provide this information (step 1204), the user is given a "basic rating" (step 1206), providing a low level of buying or

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selling privileges.

If the user does authorize the use of the credit information, the registration server obtains a credit rating from a credit information service (step **1208**). If
5 the user's credit rating is positive (step **1210**), a higher-than-basic rating is calculated for the user (step **1212**). If the user's credit rating is negative, then the user receives a "basic rating" (step **1214**).

If the user is not new (step **1202**), then the user is
10 prompted as to whether to update the user's rating. If the user wishes to update the user's rating (step **1216**), a new rating based on the amount purchased or sold and any positive or negative feedback from other users is calculated for the user (step **1212**).

If the user does not opt to receive the next rating,
15 it is determined whether the user has positive information or trading history that would warrant an increase in rating (step **1218**). If so, then a new rating is calculated for the user (step **1212**). If not, the user
20 retains the user's current rating (step **1220**).

One of ordinary skill in the art will appreciate that many variations on the present invention are possible. For instance, in accordance with an alternative embodiment of the present invention, sellers'
25 reliability ratings can be displayed to prospective bidders, so that bidders may be more selective with their bidding. A number of other variations are possible by consolidating one or more subsets of the servers utilized; for instance, it is entirely possible for the
30 registration server, rating server, trading history server, and auction server to all be the same server.

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Also, a user who receives an unfavorable reliability rating may wish to discover why the user was rated poorly. In such cases, the user may be provided with an explanation for why the user was given a low rating.

5 It is important to note that while the present invention has been described in the context of a fully functioning data processing system, those of ordinary skill in the art will appreciate that the processes of the present invention are capable of being distributed in
10 the form of a computer readable medium of instructions and a variety of forms and that the present invention applies equally regardless of the particular type of signal bearing media actually used to carry out the distribution. Examples of computer readable media
15 include recordable-type media, such as a floppy disk, a hard disk drive, a RAM, CD-ROMs, DVD-ROMs, and transmission-type media, such as digital and analog communications links, wired or wireless communications links using transmission forms, such as, for example,
20 radio frequency and light wave transmissions. The computer readable media may take the form of coded formats that are decoded for actual use in a particular data processing system.

 The description of the present invention has been
25 presented for purposes of illustration and description, and is not intended to be exhaustive or limited to the invention in the form disclosed. Many modifications and variations will be apparent to those of ordinary skill in the art. The embodiment was chosen and described in
30 order to best explain the principles of the invention, the practical application, and to enable others of ordinary skill in the art to understand the invention for

various embodiments with various modifications as are suited to the particular use contemplated.